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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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HEWLETT-PACKARD COMPANY
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EXAMINER

SCHILLINGER, LAURA M

ART UNIT PAPER NUMBER

2813

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/891,324

Applicant(s)

NAKAGAWA, OSAMU SAMUEL

Examiner

Laura M Schillinger

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

This Office Action is in response to Amendment A, dated 5/27/03, in Paper No. 7.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Amended claim 1 recites “forming a first electrode in a first dielectric layer”, this language contradicts the description provided by Applicant’s specification on page 3, lines 17-18, again on page 5, lines: 16-17 which recites “forming a first electrode in a first metal layer”.

Note: Despite the contradiction of language found within the specification, amended claim 1 does not add new matter since Figs 3A through 3E show the formation of a first electrode (320-324) in a first dielectric layer (305).

Second, amended claim 1 recites “forming a second electrode in a second dielectric layer” this contradicts the description provided by Applicant’s specification on page 5, lines: 18-19, which recites “an upper electrode formed in a second metal layer”. Again, despite the contradiction of language, amended claim 1 does not constitute new matter since Fig.3E shows the second electrode (350) formed in second dielectric (335).

Applicant should amend the specification so that it does not contradict the Figures and claimed subject matter.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 7-12 rejected under 35 U.S.C. 102(b) as being anticipated by Lou ('680).

In reference to claim 1, Lou teaches a method comprising:

Forming a first electrode (Fig.4 (126) and Col. in a first dielectric layer (251) of the multi-level metallization device (100) (Fig.4 and Col. 7, lines: 40-50)

Depositing a substantially thin dielectric material layer (253) over the first dielectric layer (251) of the multi-level metallization device (herein after referred to as "MLM") (100) (Fig.4 and Col. 7, lines: 40-50); and

Forming a second electrode (326) in a second dielectric layer (470), wherein the second dielectric layer (470) is formed substantially over the substantially thin dielectric layer (253) (Fig.4).

In reference to claim 2, Lou teaches further comprising:

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Patterning the substantially thin dielectric material to substantially cover the first electrode (Col.6, lines: 15-16- teaching to pattern layer 250 which is a composite layer including layer 253); and

Adjusting the thickness of the thin dielectric material layer (Col.6, lines: 5-25).

In reference to claim 3, Lou teaches wherein a dielectric constant of the substantially thin dielectric layer is substantially high (Col.5, lines: 5-10- teaching that layer 251 may be silicon nitride which has a substantially high dielectric constant; see also Col.5, lines: 65-67- teaching substantially thin dielectric layer 253 may be made of the same material as 251 (aka silicon nitride)).

In reference to claim 4, Lou teaches wherein the substantially thin dielectric layer includes SiN (Col.5, lines: 5-10- teaching that layer 251 may be silicon nitride; see also Col.5, lines: 65-67- teaching substantially thin dielectric layer 253 may be made of the same material as 251 (aka silicon nitride)).

In reference to claim 7, Lou teaches further comprising:

Depositing a second dielectric layer over the substantially thin dielectric layer (col.4, lines: 10-25); and

Etching at least one via adaptive to receive the second electrode (Col.4, lines: 40-55).

In reference to claim 8, Lou teaches further comprising:

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Polishing the second metal layer (Fig.6 (38)).

In reference to claim 9, Lou teaches wherein etching the first electrode in a first dielectric layer of the MLM (Col.4, lines: 50-58).

In reference to claim 10, Lou teaches wherein the first electrode is formed in a parallel line configuration (Fig.5 (30a)).

In reference to claim 11, Lou teaches wherein the second electrode is formed in a parallel line configuration (Fig.6 (38)).

In reference to claim 12, Lou teaches wherein the dielectric is a composite (Col.6, lines: 15-16).

In reference to claim 13, Lou teaches wherein the composite comprises PZT and platinum (Col.6, lines: 5-25).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lou ('680).

In reference to claim 5, Lou fails to explicitly teach wherein the thickness of the dielectric layer is between 50 to 100 Å- however does teach that the dielectric is thin (Col.6, lines; 5-25). This claim is prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688(Fed. Cir. 1996)(claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA 1985) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and In re Aller, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

In reference to claim 6, Lou fails to explicitly teach wherein the dielectric constant is between 4 and 100, however does teach that the dielectric constant for BST is high. This claim is prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688(Fed. Cir. 1996)(claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See

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also In re Boesch, 205 USPQ 215 (CCPA 1985) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and In re Aller, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M Schillinger whose telephone number is (703) 308-6425. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W Whitehead, Jr. can be reached on (703) 308-4940. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LMS

February 23, 2004


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